Claims

1. A method for implementing quality of service in data transmissions of communication network,

characterized by the steps of:

receiving a packet sent by an application,

determining a quality of service level by using information transmitted with said packet and, in accordance with said quality of service level,

performing a quality of service operation in a communication protocol stack, the quality of service operation belonging to a set that contains at least two of the following cases: transmitting the packet to another application via the communication network, removing of the packet, or placing the packet with the quality of service level in a queue.

2. The method as described in claim 1, characterized by the further step of:

replacing the packet in the queue in another position when either the number of packet retransmission requests or the number of missing packet acknowledgements reaches a predetermined threshold value, wherein the other position in the queue is determined by the quality of service level of the packet.

3. The method as described in claim 1, characterized by the further step of:

removing the packet from the queue on grounds of the quality of service level of the packet when either the number of packet retransmission requests or the number of missing packet acknowledgements reaches a predefined threshold.

4. The method as described in claim 1, characterized by the further step of:

calculating usable transmission capacity by taking into account maximum transmission capacity and the number of bytes currently used to receive data.

5. The method as described in claim 4, characterized by the further step of:

removing the packet from the queue by taking into account the quality of service level of the packet and the usable transmission capacity.

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6. The method as described in claim 4, characterized by the further step of:

transmitting the packet via the communication network to another application when the packet is located in the head of the queue and when the usable transmission capacity allows sending the packet.

7. The method as described in claim 1, characterized in that the quality of service level is composed of at least two attributes of which one determines the position of the packet in the queue when either the number of packet retransmission requests or the number of missing packet acknowledgements reaches a predetermined threshold.

8. The method as described in claim 1, characterized in that the information transmitted with a packet contains at least one of the following pieces of information: an identifier of the application, user data related to the application, a model of a terminal through which the packet was sent, an Internet peripheral address, a calling number, an operator prefix, a called party, a site from which the packet was sent, or a time when the packet was sent.

9. The method as described in claim 8, characterized in that the quality of the service level is obtained as a function of the information, said function being composed of one or more rules.

10. The method as described in claim 9, characterized in that the rules are configurable by at least one of the following parties: a user of the application, a receiver of the packet, a service provider of the communication network, or an administrator administrating the use of the method.

11. The method as described in claim 9, characterized by the further step of:

receiving a packet sent from another node of the communication network, said packet being intended for configuring the rules.

12. The method as described in claim 9, characterized by the further step of:

sending a packet to another node of the communication network, said packet being intended for configuring the rules of the other node.

13. The method as described in claim 1, characterized in that at least the quality of service operation is implemented in the communication protocol stack.

14. The method as described in claim 1, characterized in that the method is implemented in one layer of the communication protocol stack.

15. The method as described in claim 1, characterized in that the method is implemented in at least two layers of the communication protocol stack.

16. The method as described in claim 15, characterized in that the communication between said layers is based on an additional header which is transmitted with the packet from one layer to another, the additional header including the quality of service level of the packet.

17. The method as described in claim 15, characterized in that the communication between said layers is performed as follows:

receiving the packet on a layer of the communication protocol stack,

sending a quality of service level request from said layer to an upper layer of the communication protocol stack, the quality of service level request including information about the packet received,

finding out the quality of service level in said upper level by using the said information and the rules, and

returning the quality of service level of the packet as a response to the quality of service level request.

18. The method as described in claim 1, characterized in that the communication protocol stack is a WAP stack.

19. Apparatus implementing quality of service in data transmissions of a communication network,

characterized in that the apparatus includes a modified communication protocol stack and is adapted to:

receive a packet sent by an application,

determine a quality of service level by using information transmitted with said packet, and, in accordance with said quality of service level,

perform a quality of service operation in the modified communication protocol stack, the quality of service operation belonging to a set which contains at least two of the following cases: transmitting the packet to another application via the communication network, removing of the packet, or placing the packet with the quality of service level in a queue.

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20. The apparatus as described in claim 19, characterized in that the apparatus is further adapted to replace the packet in the queue in another position when either the number of packet retransmission requests or the number of missing packet acknowledgements reaches a predetermined threshold value, wherein the other position is determined by the quality of service level of the packet.

21. The apparatus as described in claim 19, characterized in that the apparatus is further adapted to remove the packet from the queue on grounds of the quality of service level of the packet when either the number of packet retransmission requests or the number of missing packet acknowledgements reaches a predetermined threshold value.

22. The apparatus as described in claim 19, characterized in that the apparatus is further adapted to calculate usable transmission capacity by taking into account maximum transmission capacity and the number of bytes currently used to receive data.

23. The apparatus as described in claim 22, characterized in that the apparatus is further adapted to remove the packet from the queue by taking into account the quality of service level of the packet and the usable transmission capacity.

24. The apparatus as described in claim 22, characterized in that the apparatus is further adapted to transmit the packet via the communication network to another application when the packet is located in the head of the queue and when the usable transmission capacity allows sending the packet.

25. The apparatus as described in claim 19, characterized in that the quality of service level is composed of at least two attributes, of which one determines the position of the packet in the queue when either the number of packet retransmission requests or the number of missing packet acknowledgements reaches a predetermined threshold.

26. The apparatus as described in claim 19, characterized in that the information transmitted with a packet contains at least one of the following pieces of information: an identifier of the application, user data related to the application, a model of a terminal through which the packet was sent, an Internet peripheral address, a calling number, an operator prefix, a called party, a site from which the packet was sent, or a time when the packet was sent.

27. The apparatus as described in claim 19, characterized in that the apparatus is further adapted to obtain the quality of service level as a function of the information, said function being composed of one or more rules.

28. The apparatus as described in claim 27, characterized in that the rules are configurable by at least one of the following parties: a user of the application, a receiver of the packet, a service provider of the communication network, or an administrator of the apparatus, and the apparatus is further adapted to provide at least one user interface for said parties.

29. The apparatus as described in claim 27, characterized in that the apparatus is further adapted to:

receive a packet sent by another node of the communication network, and

configure the rules in accordance with the content of said packet.

30. The apparatus as described in claim 27, characterized in that the apparatus is further adapted to:

send a packet sent to another node of the communication network, said packet being intended for configuring the rules of the other node.

31. The apparatus as described in claim 19, characterized in that the communication protocol stack is a WAP stack.

32. The apparatus as described in claim 19, characterized in that at least the quality of service operation is implemented in the communication protocol stack.

33. The apparatus as described in claim 19, characterized in that the apparatus is placed in one layer of the communication protocol stack.

34. The apparatus as described in claim 19, characterized in that the apparatus is placed in at least two layers of the communication protocol stack.

35. The apparatus as described in claim 34, characterized in that the apparatus is further adapted to:

add an additional header to the packet, the additional header including the quality of service level, and

transmit said packet from one layer of the communication protocol stack to another.

36. The apparatus as described in claim 34, characterized in that the apparatus is further adapted to:

receive a packet on a layer of the communication protocol stack and

send a quality of service level request from said layer to an upper layer of the communication protocol stack, the quality of service level request including information about the packet received,

find out the quality of service level in said upper level by using the said information and the rules, and

return the quality of service level of the packet as a response to the quality of the level request.

37. The apparatus as described in claim 19, characterized in that the communication protocol stack is a WAP stack.

38. The apparatus as described in claim 19, characterized in that the apparatus is a terminal.

39. The apparatus as described in claim 19, characterized in that the apparatus is a server.

40. The apparatus as described in claim 19, characterized in that the apparatus includes at least one of the following devices/software: a WAP gateway, a proxy server, or a HTTP server.

41. The apparatus as described in claim 19, characterized in that the apparatus is further adapted to communicate with at least one the following external systems: a billing system, a subscriber database, or a positioning system.

42. The apparatus as described in claim 19, characterized in that the apparatus is implemented as software.